The Dirt on Composting

A simple guide to composting food and yard waste in your backyard

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What is compost?

Compost is just organic materials that have rotted to the point where plants can use the nutrients. Consider the forest floor. Leaves, logs, and dead animals pile up, rot and make fertile soil. Home composting is a way to manage this process so that it is faster and more convenient. Approximately 28 percent of the waste that Nashville residents create each year is food and yard waste that could be composted.

The gardener's best friend!

Compost improves the structure and fertility of garden soil. It makes clay soil drain better, and it makes sandy soil hold more water. Compost adds nutrients to the soil and provides a source of good bacteria. This home-grown additive will bring your soil to a neutral pH and prevent plant diseases. Compost is the answer to most gardening problems.

SIMPLE COMPOSTING

Follow these easy directions, and you can have free fertilizer with very little work:

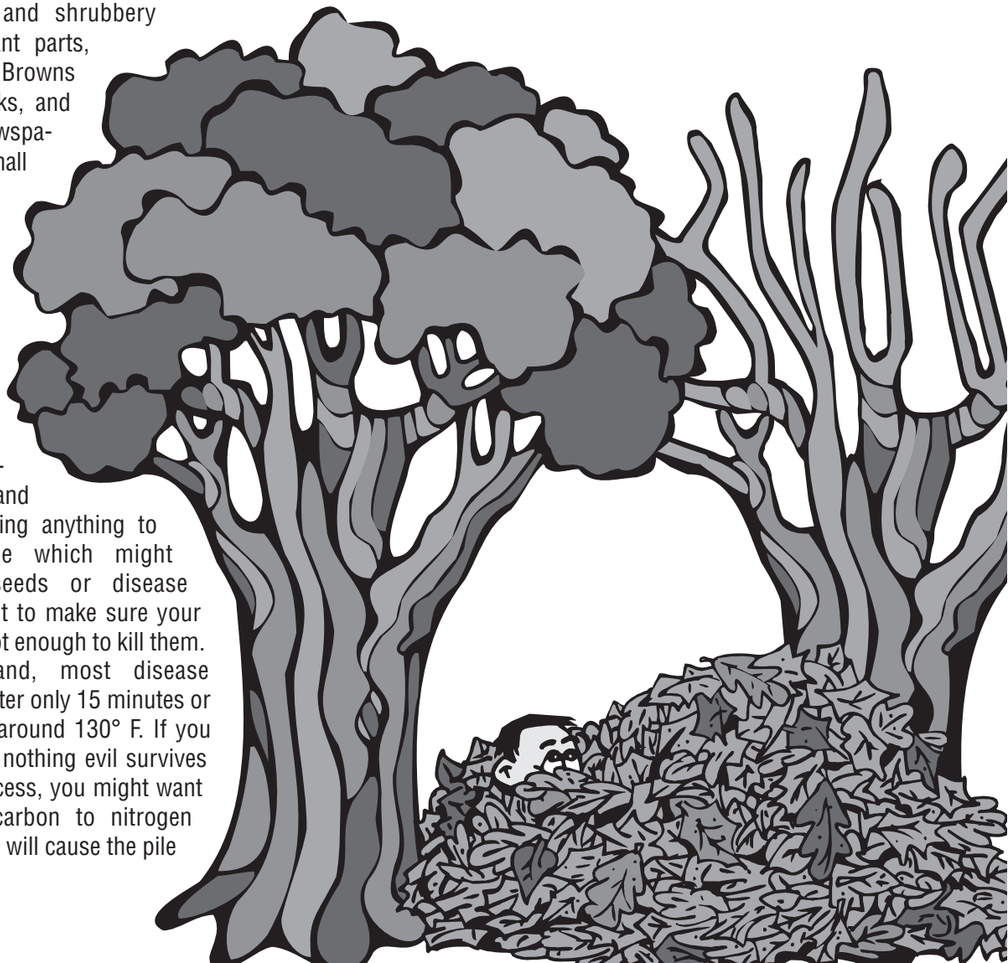
1. **Decide whether you want to make a compost bin or buy one. If you make a bin, it is recommended that you do not use treated wood, as it will leach harmful chemicals into the compost. Chicken wire wrapped around poles makes a great compost bin.**
2. **Ideally the compost bin will have an open bottom so that worms and other organisms can crawl out of the earth and into your pile where they will go to work for you. If you use a completely enclosed compost bin, make sure you throw in some dirt from your garden and toss in a few worms.**
3. **All these things can be added to the compost bin: grass clippings (only those without any fertilizer or herbicides), parts of bushes you have clipped off, sticks of all sizes (they won't rot quickly but they make important air spaces in the pile), brown and green tree leaves, vegetable and fruit peelings from the kitchen, coffee grounds and paper filters, tea leaves and bags, weeds (but be warned that some weeds will grow in the pile – once you see which ones grow, avoid them in the future), dead plants (but not diseased or bug-filled plants). Avoid meats, bones, and fats as they can attract rodents.**
4. **Now be patient, and let nature take its course. The pile will gradually sink down as the stuff rots. Continually add new materials, covering food stuffs with leaves or plant clippings to keep flies and squirrels out of the pile.**
5. **Harvest the compost from the bottom of the pile. You don't need to wait until the entire pile has turned to dirt, simply steal the finished compost from the bottom as you need it. Compost is ready when it looks like either mulch or soil. Spread it around your plants and mix it into the soil at any time of the year.**
6. **Be very proud of your efforts!**

What's the deal with greens and browns?

So-called green ingredients provide nitrogen. So-called brown ingredients provide carbon. Mixed together they make heat, which makes your compost rot faster.

Greens are grass and shrubbery clippings, fresh plant parts, and kitchen scraps. Browns are dry leaves, sticks, and newspaper. Yes, newspaper is OK to use in small amounts, preferably shredded. It is best if the newspaper is printed using soy ink.

The ideal carbon to nitrogen ratio is 30:1. Is this important for a backyard composting pile? Well, yes and no. If you are adding anything to your compost pile which might contain weed seeds or disease pathogens, you want to make sure your compost pile gets hot enough to kill them. On the other hand, most disease pathogens will die after only 15 minutes or so at temperatures around 130° F. If you want to ensure that nothing evil survives the composting process, you might want to increase your carbon to nitrogen ration to 20:1, which will cause the pile to get hotter.



When it's hot...it's hot

If you are really interested in managing your compost, you might want to invest in a compost thermometer with a long probe so that you can check the temperature from time to time. You will notice that compost temperature tends to spike at around 150° F and then starts to drop. When the temperature starts to drop to around 100° F it is a good time to turn the compost. When the temperature is no longer fluctuating, the compost is ready.

If you are in a hurry to produce compost to add to your garden, you might want to turn the pile before the temperature reaches 131° F. This will require turning your pile more often, but since the pile will be sustaining optimum temperatures longer, you will produce compost much faster.

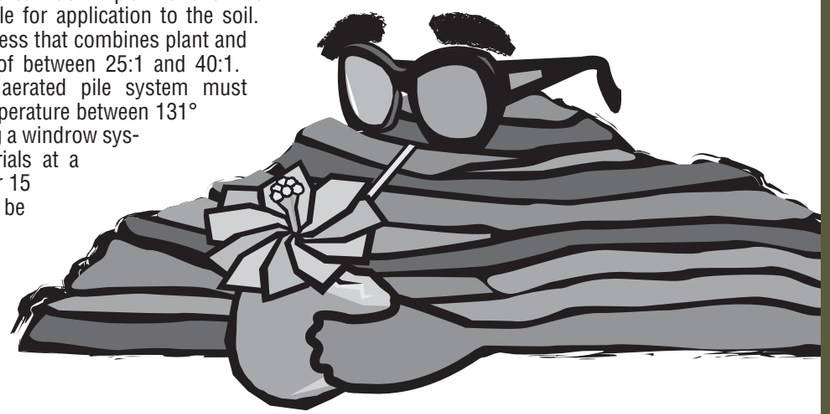
When it's not...it's not

So-called "cold compost" is also good compost. Don't worry if you don't want to be bothered with taking the temperature of your pile, or if your pile doesn't reach the optimum temperature. Your compost will still rot, just a little more slowly. The truth is that many homes won't produce enough yard and kitchen waste to make a pile that is large enough to heat up very much. It also is unlikely that you will have the materials to create the exact carbon to nitrogen ratio that makes for the perfect hot pile.

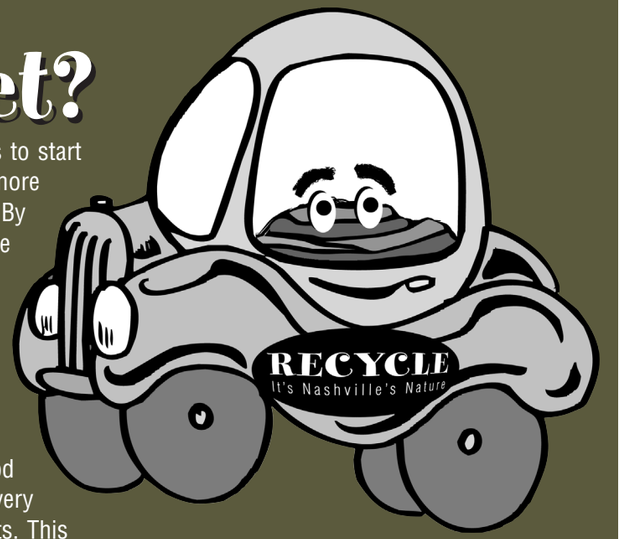
Never fear the cold compost pile! It actually is easier to just let it be and let it rot without worrying about turning it or taking its vital signs. Keep in mind, however, that this method is slower than a hot compost pile. It may take six months or so to get your first load of finished compost. You should also be aware that seeds and pathogens will not die in the cold compost, making it important to keep weed seeds and diseased plants out of the mixture.

USDA's Official Definition of Organic Compost: The product of a managed process through which microorganisms break down plant and animal materials into more available forms suitable for application to the soil. Compost must be produced through a process that combines plant and animal materials with an initial C:N ratio of between 25:1 and 40:1. Producers using an in-vessel or static aerated pile system must maintain the composting materials at a temperature between 131° F and 170° F for three days. Producers using a windrow system must maintain the composting materials at a temperature between 131° F and 170° F for 15 days, during which time the materials must be turned a minimum of five times.

(DEPARTMENT OF AGRICULTURE,
Agricultural Marketing Service,
7 CFR Part 205)
http://www.ams.usda.gov/nop/regtext.htm



Are we there yet?



Once you have started your compost pile, you'll be anxious to start reaping the rewards! Something to keep in mind is that the more involved you are, the sooner you will have your end product. By turning the pile after the temperature spikes, and making sure you have good levels of greens and browns, you can produce rich compost in as little as three weeks. Most backyard composters don't have the time or desire to get that involved with the process. For less managed compost piles, you should expect it to take several months for the process to complete.

If this still sounds like too much work, try the laziest method (and my personal favorite). Add a layer of sticks between every 6 inches or so of food and yard wastes to create air pockets. This takes the place of turning the pile. Really!

Be patient. No matter how involved or uninvolved you are, composting is a natural process that will occur.

WHAT GOES IN?

Material Sources of Nitrogen and Carbon:

- Fruit and vegetable scraps (N)
- Coffee grounds and filter (N)
- Tea bags and loose tea (N)
- Grass clippings (N)
- Shrubbery clippings (N)
- Old or dead plants and plant clippings (C and N)
- Most weeds (C and N)
- Leaves, wet or dry (C and N)
- Small sticks less than 1 inch in diameter (C)
- Newspaper and other paper (C)
- Straw and hay (C)
- Wood chips (C)

WHAT STAYS OUT?

Although compostable, these items will attract rodents:

- Meat or fish scraps (just remember: nothing with a face!)
- Bones
- Fat, in solid or liquid form

These items from your yard will contaminate your compost:

- Plants that seem to be diseased - when in doubt, leave it out!
- Anything treated with herbicides or pesticides
- Bermuda grass - it will grow in the compost!
- Weeds that are persistent problems in your garden
- Weeds with seeds (unless the pile heats up to at least 131° F)
- Pet feces or pet bedding – these items can carry diseases that people can catch.

COMPOSTING MYTHS: FICTION VS. FACT

Compost smells bad.

Fact: Only when there is too much wet material. Poke a smelly compost pile to get some air into it, and the smell will become more like clean soil.

Compost piles are hard work and must be turned over very often.

Fact: Turning a pile adds air to its innards so it rots faster. If you throw in some sticks every now and then, air pockets will be created naturally and you avoid having to turn the pile.

Lots of bugs are in the compost pile, and they will hurt my plants.

Fact: The animals you see in compost – worms, roly-poly bugs, centipedes – are working for you by decomposing the organic matter and making the nutrients available to plants in the form of compost.

Compost piles must get very hot inside or they aren't working.

Fact: A cold compost pile will rot just fine, but perhaps a bit more slowly than one that gets hot.

I have to water the compost pile often or it won't work.

Fact: Sure, wet stuff rots faster than dry stuff, but concentrate on adding moisture in the form of fruit and vegetable peelings, coffee grounds and tea leaves, or gray water (collect the water you use to wash out recyclable cans and bottles and pour it onto the compost pile) instead of using fresh water.

Lime, alfalfa pellets, and other amendments have to be added to the pile in order to make it rich in nutrients.

Fact: There is no need to buy anything to apply to a compost pile. The nutrients from the decomposed organic matter are rich enough.

It is necessary to purchase and add "compost starter."

Fact: A shovel of regular garden soil should be added to the compost pile when you start a brand-new pile. After that it works fine by itself. You can add some out-of-date yeast, old yogurt, or the water from washing out a milk bottle to speed up the process.

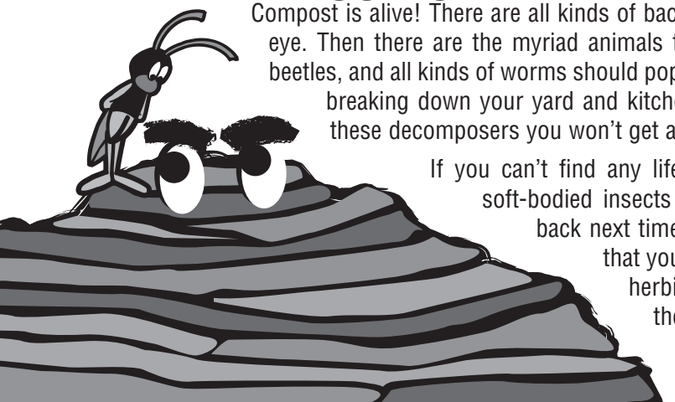
Contain yourself:
Ten types of compost containers

There are many ways to compost. Mainly it depends upon how much work you want to put into it and what you want the site to look like. Here are some ideas, listed in order from simplest to slightly more complicated.

The Pit	The Trench	The Site	The Pile	The Bag	The Loading Pallet Bin	The Tomato Ring	The Can	The Pretty Bin	The Store-Bought Composter
Dig a hole, throw your stuff into it, cover with dirt, and you are finished. You can plant on top of the compost pit immediately.	Just like the pit, except you start with a trench. Plant a row of seeds or transplants on either side of the filled trench.	Lay your kitchen and plant waste directly on top of a garden bed. Cover with leaves and a little bit of dirt and let it rot. Wait a month and then begin planting.	Just like it sounds – pile everything up and it will make compost.	Pile everything into a black trash bag. Throw in a shovel of garden soil. Poke a few holes for air circulation. Loosely tie up the open end.	Get three loading pallets (usually they are free) from a local warehouse or grocery store. Wire them together at the corners, leaving one side open.	Drive four poles into the ground. Surround the poles with chicken wire to make a cage. Plant tomatoes on the outside and dump your stuff into the cage.	Cut the bottom off of an old plastic trash can. Drill holes in the middle of the sides for air circulation.	Use plain, untreated lumber to make a three-sided bin. Add a gate to make it really attractive.	There are many varieties and styles of plastic bins. You can choose one that matches your house and fits in with your neighborhood rules.

Visit Nashville's home-composting demonstration site in the Organic Garden at Scarritt-Bennett to see other types of composters.

What's bugging your pile?



Compost is alive! There are all kinds of bacteria and microorganisms too small to see with the naked eye. Then there are the myriad animals that you can see: roly-poly or pill bugs, millipedes, ants, beetles, and all kinds of worms should populate your compost. Each of these is working hard for you, breaking down your yard and kitchen waste into nutrients that your plants can use. Without these decomposers you won't get any compost.

If you can't find any life in your compost pile, then it may be so dry that the soft-bodied insects have tunneled into the earth for moisture. They'll come back next time you throw in some moist food waste. It is also possible that you accidentally poisoned the decomposers with pesticide- or herbicide-contaminated plants. Try adding some garden soil to the pile to introduce new life.

Compost Tea

What do you do if you don't have enough compost to fulfill all your gardening needs? No one ever has enough compost! You can stretch the compost you do have by making compost tea. Here is a simple recipe.

1. Place a handful of compost into the foot of an old pair of pantyhose. Tie shut and cut off the excess. This is your tea bag.
2. Put the tea bag into a bucket and add water. You can use the resulting tea immediately to water your seeds. This is especially good to use on new seedlings and transplants. Compost tea makes an excellent foliar spray for houseplants.
3. Leave the tea bag in the bucket and use it over and over again.

Now that I've got it... How do I use it?

Use compost in all the ways that you would think of using fertilizer. The most common uses include:

- when starting a garden bed, add compost to a new bed and to any newly prepared bed.
- when transplanting, place some compost into the bottom of the planting hole.
- when mulching, put compost around the plants before you add mulch.
- when watering, add compost to the watering bucket and stir it up.
- when plants don't look so good, surround them with compost.
- when container gardening, top off potted plants with a layer of compost.

FREE compost activators

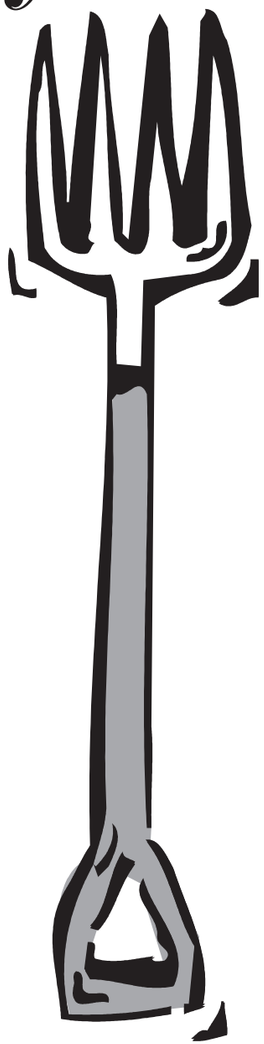
There are lots of preparations marketed as compost activators. They claim to speed up the rate of decomposition. These things won't hurt your compost, but they probably won't do any better than these home remedies.

Wash out a yogurt container, one that had active yogurt cultures, and add the water to the compost. Do the same when you finish a carton of milk. Old dry yeast can be disposed of in the compost pile, and it may even still have some live yeast to help with decomposition. Empty the dregs from beer cans and bottles into the pile to give it another helping of yeast.

Shopping anyone?

The beauty of composting is that it is such a natural process and will happen with very little help from you. You really won't need many tools for a simple compost pile. However, for those who love to have the right tool for the job, here are a few things which will come in handy when you're working with your compost pile.

- **Compost fork or other gardening fork to turn your compost pile**
- **Wheelbarrow to haul compost to and from your pile**
- **Pruners or loppers to trim branches to put on your pile**
- **Compost thermometer to check the temperature of your pile so you'll know when it is ready**
- **Aerator to get more air into the pile**



But, what if....?

Given time, everything rots. With composting, it's *how* things rot that seems to confuse people. Here are the most commonly reported composting problems with some very simple solutions.

WHAT IF YOUR COMPOST...	THEN TRY THIS!
is not heating up?	Making hot compost requires volume and some work. The pile needs to be at least 3 feet by 3 feet by 3 feet. Make 6-inch layers, alternating green materials and brown materials. When the pile gets very hot, turn it all over and let it heat up again.
is dry?	Dig a hole in the pile and add wet kitchen scraps. There is no need to water it down with the garden hose. In the future keep it covered during dry spells to keep moisture in.
stinks?	Poke it with a shovel to let some air circulate through it. In the future throw some sticks on top of each layer of wet stuff to provide air circulation.
is not making compost?	Look under the pile. You should find some decomposed mulch-type materials and possibly even some newly created soil. Both qualify as compost.
is made only of browns?	Add some greens, or just let it be. A pile of leaves will make fine compost all by itself. It might even heat up.
is made only of greens?	Green ingredients all by themselves will rot, but they may stink. Add some newspaper; no more than one quarter of the total material should be paper. Add sticks throughout the pile to permit air circulation.
is attracting flies?	Cover kitchen scraps with leaves, or bury them deep in the pile.
is attracting animals?	Try using a closed container. In the winter, birds and other animals might sit on the compost to get warm!

Composting with WORMS!

More formally called vermiculture, worm composting is lots of fun and easy to do indoors when you don't have room or permission to have an outside compost bin. The basic idea is that you are keeping worms as your personal garbage disposal.

Special worm bins can be expensive, but the worms will be just as happy in a bin you make yourself.

- **A plastic bin with a top**
  (Minimum of 2 square feet in size: The bigger the bin, the more worms; the more worms, the more food waste will be composted.)
- **A slightly larger bin or pan that fits underneath the worm bin**
- **Window screen or other fine mesh metal or plastic screen**
- **Shredded newspaper**
- **Tools: scissors and drill**
- **Food scraps**
- **Red worms, aka red wigglers**
  (Regular earthworms won't work or play well in this environment.) These can be purchased from a fishing bait store.

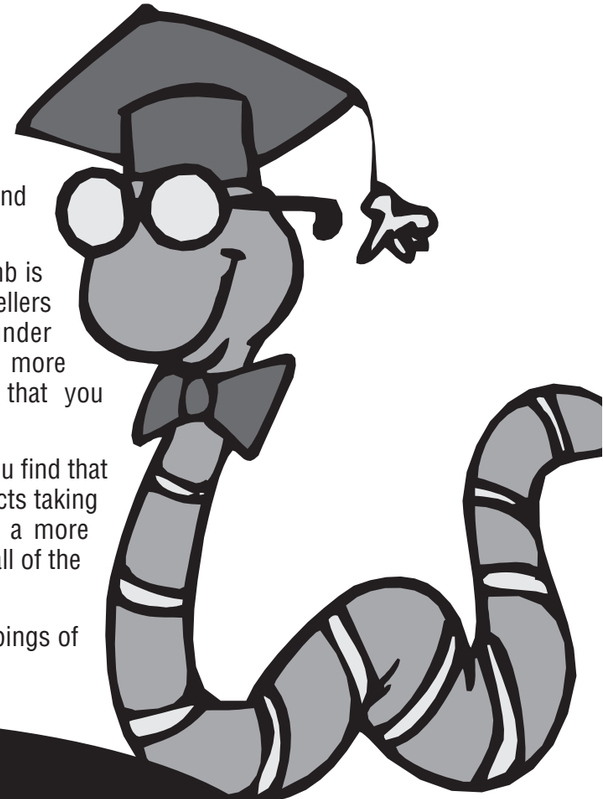
WORM COMPOSTING

1. **Drill holes in the bottom of the bin to allow for drainage. Drill more holes around the sides of the bin for air circulation.**
2. **Cut a piece of window screen or fine mesh to cover the inside of the bottom of the bin. This keeps the worms from falling out or attempting an escape!**
3. **Shred enough newspaper to provide about 2 inches of bedding at the bottom of the bin.**
4. **Moisten the newspaper so that it is about as wet as a wrung-out sponge. Worms need to keep their skin moist in order to breathe, but you don't want to drown them.**
5. **Add worms. How many worms depends on how quickly you want the garbage to disappear. But you don't necessarily need to start with a huge amount of worms. Besides eating, they will be reproducing! If you get too many worms, consider passing them on to your friends, neighbors, or local schools. You can also throw the extra worms outside for the birds to eat. Don't feel guilty, as the red worms can't live in the soil.**
6. **Now the fun begins – Feed your living garbage disposal by burying food scraps in the newspaper bedding. Start with a small amount of food, about equal to the amount of worms you have. Add more food as needed. The amount of food can be increased as the amount of worms in the bin increases. Keep the bin covered to prevent flies from laying eggs on the food.**

The payoff comes when you harvest the worm castings (the poop). This is really easy and quite a bit of fun. Simply remove the lid, and the worms will burrow down to escape the light. To make the worms move more quickly you can shine a light directly on the pile of food, castings, bedding and worms. Carefully scoop out the castings, which look like dirt. Use the castings in the same ways you would use compost.

Wormy Wisdom

- **Don't let the worms drown!** Worm tea will leak out of the bin into the pan underneath. Make sure to empty the pan so that the liquid doesn't build up in the bin and kill your critters. Use the tea as a liquid fertilizer.
- **Don't let the worms fry or freeze!** A good rule of thumb is to keep the worms at room temperature. Apartment dwellers have been known to keep worm bins under the kitchen sink or in the laundry room. It will be more convenient to use if you keep it near the place that you produce food waste.
- **Don't let other creatures take over the worm bin!** If you find that flies have laid eggs in the worm bin, or have other insects taking over, dispose of everything and start over. Try using a more tightly fitting lid on the bin and use screening to cover all of the holes in the bin to prevent intruders.
- **Don't give up on your worms!** You may lose a few helpings of worms before you get the hang of it.



Curby says:

Remember "The Rule of One." One pound of worms will eat one pound of food waste in a 1-square-foot bin in one day.

Who you gonna call?

Metro Nashville's Division of Waste Management .....**(615) 862-8620**

Scarritt-Bennett Composting & Organic Garden Project.....**(615) 340-7471**

Bordeaux Compost Facility .....**(615) 862-8640**

Resources at the Laskey Library

Scarritt-Bennett Center
1008 19th Avenue South
Nashville, Tennessee 37212
(615) 340-7479

"The ABCs of Composting." Nashville, Tenn.: WDCN Channel 8 (now WNPT), Volunteer Gardener, April 12, 1997. 30 minutes. Videocassette. Filmed at Scarritt-Bennett's organic garden where Julie Berbiglia explains a variety of cheap and easy composting methods. VCT 110365

"Garbage." WETA-TV. Planet Neighborhood: Home (Tape 1) and Study Guide. Washington, D.C.: WETA Publications, 1997. Approximately one hour. Videocassette. The last section on this tape examines how Bellport, Long Island, instituted community composting. Teacher Guide (page 12) includes a recycling activity with instructions for a garbage can composter. VCT 111794

"Backyard Composting: your complete guide to recycling yard clippings." Ojai, Calif.: Harmonious Press, 1992. S661.B34 1992

"Let it Rot!: the gardener's guide to composting." Campbell, Stu. Pownal, Va.: Storey Communications, 1998. S661.C35 1998

"Make Compost in 14 Days." Emmaus, Pa.: Rodale Press, Inc., 1982. S661.M35 1996

"Worms Eat My Garbage." Applehof, Mary. Kalamazoo, Mich.: Flower Press, 1982. SB597.E3 A67 1982

*For updated resources, check out our Web site at www.nashville.gov/recycle.

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MEETING • LEARNING • RENEWING

RECYCLE
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For more details and photographs,
visit **www.nashville.gov/recycle** and click on "Composting."

Metropolitan Government of Nashville and Davidson County
Department of Public Works

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